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type is the result of a long struggle for existence between different species, in which only those possessing the greatest vitality and best fitted to the physical conditions of situation succeed in occupying the ground and form tree associations having a distinct physiognomy. One of the most important characteristics of a forest type is its stability, its resistance to invasion by other plant forms. \* \* \*

#### THE FOSSIL ARACHNIDA OF BOHEMIA.

WE are indebted to Professor Dr. Anton Fritsch for another important contribution on the Permian and Cretaceous fauna of Bohemia entitled 'Neue Fische und Reptilien.' This takes the form of a quarto appendix to his previously published volumes, and is illustrated by nine plates. The Cretaceous forms described are new teleosts, plesiosaurs, mosasaurs and pterosaurs.

In 1904 there appeared from the pen and brush of this ardent paleontologist a fine monograph on the Paleozoic arachnida, consisting of eighty pages of text and fifteen plates. The conclusions reached in this monograph are most striking, especially as to the very great antiquity of modern forms. The author observes "If we examine the entire series of the forms described we must recognize that there are many which present no very striking differences from the Arachnida of to-day. They are to be regarded as the direct ancestors of families now existing in part as lateral branches which have later become extinct." This is true of members of six families described. The scorpions of the Silurian period show in their foot structure a primitive form suggesting that of the Crustacea whereas those of the Carboniferous and Permian formations exhibit close resemblance to the foot structure of the modern types.

H. F. O.

#### EXTENDED EXPLORATIONS OF THE ATMOSPHERE BY THE BLUE HILL OBSERVATORY.

ACCOUNTS of the first experiments in this country with *ballons-sondes*, for the purpose of ascertaining the meteorological conditions

at great heights above the American continent, appeared in SCIENCE, Vol. XXI., pp. 76-77 and 335. During the months of January, February and March, 1905, nine more ascents were made from St. Louis and every balloon but one was found and, with the attached instrument, was returned to Blue Hill in accordance with the instructions on each. Like the previous balloons, all of these fell within the eastern half of a circle having its center at St. Louis and a radius of 285 miles. The German expanding rubber-balloons, filled with hydrogen generated by the vitriolic process, were again employed, as were the French self-recording instruments, which gave at least partial records of barometric pressure and air-temperature in seven of the nine ascensions, although another record was obliterated by the finder. On January 25, when a high barometric pressure prevailed at the ground, a temperature of  $-111^{\circ}$  F. was recorded at the height of 48,700 feet, this being one of the lowest natural temperatures ever observed. The experiments last winter were conducted by Mr. Clayton, under the direction of Mr. Rotch, and their success induced Professor Langley, secretary of the Smithsonian Institution, to grant Mr. Rotch \$1,000 from the Hodgkins Fund, in order to continue the experiments this summer at St. Louis. These, like the first, will be conducted by Mr. Fergusson, of the Blue Hill Observatory staff. Soundings of the atmosphere made at different seasons should reveal the annual variation of temperature at great heights above the American continent, which is at present unknown.

However, kites are not neglected at Blue Hill, for, besides the flights made there each month on the days fixed by an international committee, they are also being employed to ascertain the conditions above the Atlantic Ocean in the trade-wind region. Thus the investigation which was first proposed by Mr. Rotch in SCIENCE, Vol. XIV., pp. 412-413, and which has been persistently advocated by him since, is now in progress, and this was rendered possible through the cooperation of the well-known French meteorologist, M. L. Teisserenc de Bort, who placed his steam-yacht at the disposal of Mr. Rotch, on condi-